UGC NET - ELECTRONIC SCIENCE

MOCK TEST PAPER

- **PAPER - I** *This paper contains 50 objective type questions. Each question carries 2 marks. Attempt all the questions.*
- **PAPER - II** *This paper contains 100 objective type questions. Each question carries 2 marks. Attempt all the questions.*
- *Pattern of questions : MCQs*
- *Total marks (PAPER I & II) : 300*
- *Duration of test : Paper I - 1 Hour*
  : Paper II - 2 Hours

PAPER-I

1. In union budget 2018-19, the government announced setting up Ekalavya Model Residential School, Consider the following statement about it.

(i) It will provide the best quality education to the tribal childrenin their own environment

(ii) by 2022 it will be build in every block with more than 50% ST population.

(iii) It will focus on preserving local art and culture.

Which of the statement given above is/are correct?

Select the answer using the codes given below:

(1) i and ii only (2) ii and iii only

(3) iii only (4) i, ii and iii

2. Which of the following statement is correct about the RISE by 2022 announced by government in Union budget 2018-19?

(1) It is to step up investments in Education.

(2) It is to step up investments in health.

(3) It is to step up investments in telecommunication.

(4) It is to step up investments in sports.

3. Which country to host the World Sustainable Development Summit – 2018 ?

(1) South Africa (2) Nepal

(3) Brazil (4) India

4. Which HRD Ministry-appointed committee is drafting new National Education Policy (NEP)?

(1) Ram Shanker Kureel committee

(2) K Kasturirangan committee

(3) V G S Rathore committee

(4) KJ Alphonse committee

5. With reference to Paris agreement on climate change, consider the following statements :

I. It was signed by 195 nations in Dec 2015 at Paris

II. The main aim is to keep a global temperature rise this century well below 3 degrees Celsius

III. It further aims to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels

Which of the above statements are correct ?

(1) I and II (2) II and III

(3) I, II and III (4) I and III

6. Which of the following statements are correct?

a. Parliament cannot alter the name and territory of J&K without the consent of the State legislature

b. The Union shall have the power to suspend the State Constitution on the ground of failure to comply with the directions given by the Union.

c. No proclamation of Emergency can be made by the President under Article 352 on the ground of “internal disturbance” in J&K without the concurrence of J&K Government

Which of the above statements are correct ?

(1) (a) and (b) (2) (b) and (c)

(3) (a) and (c) (4) (a), (b), (c)

7. **Assertion (A):** Global warming is the increase in Earth's near-surface air and ocean temperatures.

Reason (R): The greenhouse effect is when water and carbon dioxide absorb outgoing infrared radiation, increasing the planet's temperature

Choose the correct code:

(1) Both (A) and (R) are correct (2) Both (A) and (R) are incorrect,

(3) (A) is true and (R) is true (4) (A) is false and (R) is true

8. Which of these pairs are correctly matched ?

a. The Vienna Convention : Protection of Ozone Layer

b. Montreal Protocol : Substances that Deplete the Ozone Layer

c. The Minamata Convention : Lead

(1) a only

(2) a and b only

(3) c only

9. Representation of the People (Amendment and Validation) Bill, 2013, brought two key changes. These changes were :

• Even if a person is prohibited from voting due to being in police custody or in jail, he can file nomination for an election.

• Definition of "disqualified" in the Act has been amended. disqualification has to be due to conviction for certain specified offences and can be on no other ground.

• Anyone in prison or on the lawful custody of the police (other than preventive detention) is not entitled to vote.

Select the correct answer using the codes given below.

(1) I and ii only (2) I and iii only

(3) ii and iii only (4) I, ii, iii

10. Match List – I and List – II and identify the correct code:

a. World Health Day	i.16th September
b. World Population Day	ii. 1st December
c. World Ozone Day	iii. 11th July
d. World AIDS Day	iv. 7th April

Codes:

	a	b	c	d
(1)	i	ii	iii	iv
(2)	iv	iii	i	ii
(3)	ii	iii	iv	i
(4)	iii	iv	ii	i

11. **Assertion (A):** Water Borne diseases are largely caused by micro-organisms present in human or animal waste

Reason (R): Typhoid fever is a Water Borne diseases.

Choose the correct code:

(1) Both (A) and (R) are correct

(2) Both (A) and (R) are incorrect,

(3) (A) is true and (R) is true

(4) (A) is false and (R) is true

12. Which of the following statements regarding the meaning of research are correct

a. Research refers to a series of systematic activity or activities undertaken to find out the solution of a problem

b. It is a systematic, logical and an unbiased process wherein verification of hypothesis data analysis, interpretation and formation of principles can be done

c. It is an intellectual enquiry or quest towards truth

d. It leads to enhancement of knowledge

(1) (a), (b) and (c) (2) (b), (c) and (d)

(3) (a), (c) and (d) (4) (a), (b), (c) and (d)

13. Below are given two seat – research methods (Set-I) and data collection tools (Set-II). Match the two sets and indicate your answer by selecting the correct code:

A Experimental method	i Using primary secondary sources
B Ex post-facto method	ii Questionnaire
C Descriptive survey method	iii Standardized tests
D Historical method	iv Typical characteristics tests

Codes:

A B C D

1. ii i iii iv

2. iii iv ii i

3. ii iii i iv

4. ii iv iii i

14. Consider the following statements :

a. Teaching is the stimulation, guidance, direction and encouragement of learning

b. Good teaching is as much about passion as it is about reason

c. Good teaching is also about bridging the gap between theory and practice

Which of the above statements are correct ?

(1) a and b (2) b and c

(3) a and c (4) a, b and c

15. Consider the following statements about NITI Aayog :

a. The National Institution for Transforming India, also called NITI Aayog, was formed via a resolution of the Union Cabinet on January 1, 2015

b. NITI Aayog fosters Cooperative Federalism

c. The President is its Chairman

Which of the statements given above is/are correct ?

(1) a and b only (2) b and c only

(3) a and c (4) a, b and c

16. Imagine you are working in an educational institution where people are of equal status. Which method of communication is best suited and normally employed in such a context?

(1) Horizontal communication (2) Vertical communication

(3) Corporate communication (4) Cross communication

17. An unsolicited e-mail message sent to many recipients at once is a

(1) Worm (2) Virus

(3) Threat (4) Spam

18. If the proposition 'All thieves are poor' is false, which of the following propositions can be claimed certainly to be true?

Propositions :

(1) Some thieves are poor. (2) Some thieves are not poor.

(3) No thief is poor. (4) No poor person is a thief.

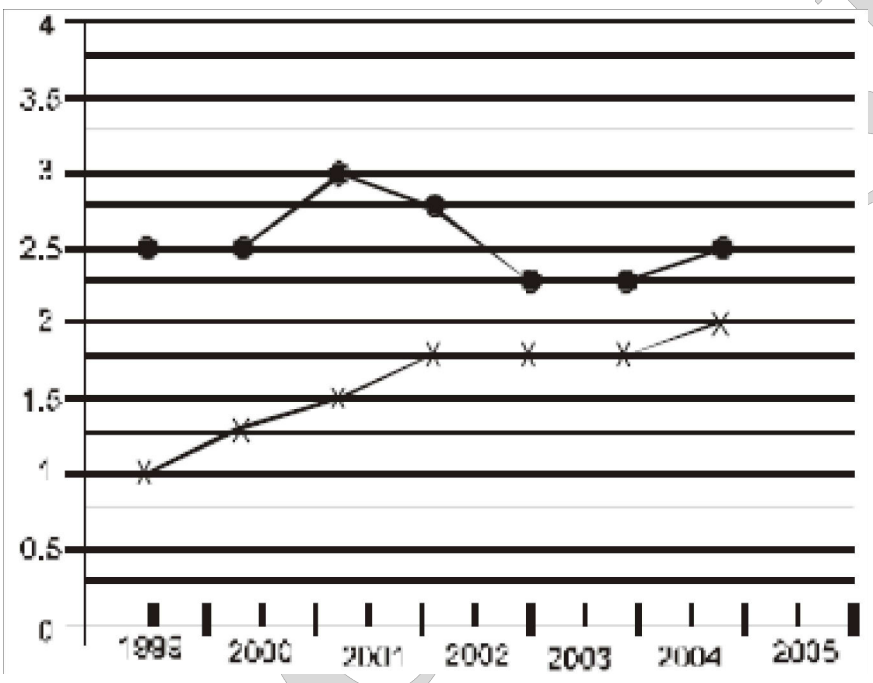
19. It is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc." which type of communication is this?

(1) Oral communication (2) Written communication

(3) Non verbal communication (4) None

Questions20-24 Study the follow ing graph carefully to answer the given questions.

PRODUCTION OF TWO COMPANIES A AND B (IN CRORE UNITS) OVER THE GIVEN YEARS



20. For Company A, how much is the percent increase in production in 2000 from 1999?

(1) 0.25 (2) 2.5

(3) 25 (4)12.5

21. How many units is the total production of Company A for the given years?

(1) 9 crores (2) 17.75 crores

(3) 12.25 crores (4) 11 crores

22. What is the difference in units produced by the two companies in 1999?

(1) 1,50,000,000 (2) 15,00,00,000

(3) 15,00,000 (4) 15,000

23. How many units is the approximate average production of Company B for the given years?

(1) 3 crores (2) 2.55 crores
(3) 2.75 crores (4) 2.25 crores

24. In which year did both the companies have no change in production from the previous year?
(1) 2000 (2) 2002
(3) 2003 (4) 2004

25. Which of the follow ing collection techniques were used as the primary research methods for this study?
(1) Qualitative (2) Quantitative
(3) Both (1) and (2) (4) None

26. Which of the follow ing problems was India faced with after Independence ?
(1) Military attack from a country across the border.
(2) Lack of coordination between the Central and State Governments.
(3) Improper coordination of various Government policies
(4) Increasing the production from a very low level

27. Which of the follow ing issues was not appropriately realized by the Central Government.
(1) Ethnic diversity of the people
(2)A national language for the country
(3) Implementation of the formulated policies
(4) Centre -State relations

28. Why was central economic planning found to be difficult?
(1) Multiplicity of States and Union Territories
(2) Lack of coordination in different Government departments
(3) Autonomy given to the States in certain matters
(4) Lack of will in implementing land reforms

29. Why was the linguistic reorganization of the State accepted?
(1) The States were not cooperating with the Central Government
(2) Non- Congress Governments in the States demanded such a reorganization of the States
(3) No common national language emerged

(4) Strong pressure from the States was exerted on the Central Government to create such States

30. Which, according to the passage, can be cited as an exercise in democratic practice in India before Independence?

(1) The handing over of pow er by the British to India

(2) The Indianisation of the Indian Civil Service

(3) A neutral role played by the Army

(4) None of the above

31. The information to be collected in survey method are related to

(1) Present Position

(2) Aims of the research

(3) The attainment of aim of research

(4) All of the above

32. One of the essential characteristics of research is

(1) Sensitivity (2) Generalizability

(3) Usability (4) Replicability

33. Identify the main Principle on which the Parliamentary System operates.

(1) Responsibility of Executive to Legislature

(2) Supremacy of Parliament

(3) Supremacy of Judiciary

(4) Theory of Separation of power

34. Match list I with list II and select the correct f rom the code given below :

List I (Institutions)	**List II (Locations)**
1. Indian Veterinary Research Institute	i. Pune
2. Institute of Armament Technology	ii. Izat Nagar
3. Indian Institute of Science	iii. Delhi
4. National Institute for Educational Pannesi and Administrators	vi. Bangalore

(1) 1-ii, 2-i, 3-iv, 4-iii (2) 1-ii, 2-iv, 3-ii, 4-iii

(3) 1-ii, 2-iii, 3- I, 4- iv (4) 1-iv, 2-iii, 3-ii, 4-i

35. The prime minister of India is appointed from _____

(1) The leading Party in Lok Sabha

(2) The Leading Party in Rajya Sabha

(3) The leading party in Lok Sabha and Rajya Sabha combined

(4) None of the above

36. The study of interrelations between Organism and their environment is called___

(1) Biosphere (2) Ecology

(3) Synecology (4) Autecology

37. The term ICT is now also used to refer to the convergence of

(1) Audio visual (2) Telephone netw ork

(3) Both (1) and (2) (4) None

38. Fossil Fuels include

(1) Oil (2) Natural Gas

(3) Coal (4) All of the above

39. Noise in excess of _____ is called noise pollution

(1) 40-65 db (2) 60-70 db (3) 80-100 db (4) None of the above

40. Effectiveness of teaching depends on ____

(1) Handwriting of Teacher (2) Speaking ability of Teacher

(3) Qualification of the Teacher (4) Subject Understanding of the Teacher

41. The participation of students w ill be maximum if ____ method is used for teaching.

(1) Text Books (2) Discussion Method

(3) Conference Method (4) Lectures

42. In following questions, number series is given. One of the numbers in each series is w rong. After searching wrong number find the correct number in its place.

510, 254, 126, 64, 30, 14, 6

(1) 252 (2) 62

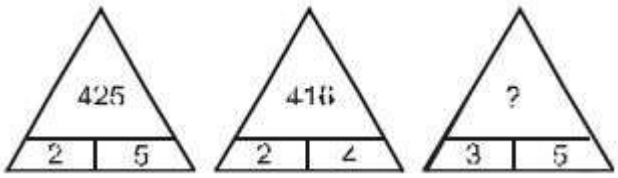
(3) 130 (4) 9

43. Which reasoning deter mines whether the truth of a conclusion can be determined for that rule, based solely on the truth of the premises?

(1) Deductive (2) Inductive

(3) Abductive (4) All

44. Insert the missing number or letter from among the given alternatives.



(1) 140 (2) 280

(3) 875 (4) 925

45. In the following question assuming the given statements to be true, find out which of the two assumptions I and II given below them is/are definitely true give answ er as.

(1) Only assumption I is implicit

(2) Only assumption II is implicit

(3) Either I or II is implicit

(4) Neither I nor II is implicit

(E) Both I and II are implicit

Statement: The State government has decided to appoint four thousand primary school teachers during the next financial year.

Assumptions:

I. There are enough schools in the state to accommodate four thousand additional pr imary school teachers.

II. The eligible candidates may not be interested to apply as the government may not finally appoint such a large number of primary school teachers.

46. What is the latest write-once optical storage media?

(1) Digital paper (2) Magneto-optical disk

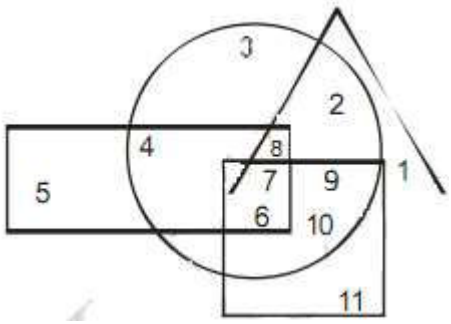
(3) WORM disk (4) CD- ROM disk

47. Which of the following identifies a specific web page and its computer on the Web?

(1) Web site (2) Web site address

(3) URL (4) Domain Name

Direction (48-49) In the following figure, rectangle, square, circle and triangle represents the regions of wheat gram, maize and rice cultivation respectively. On the basis of the figure, answer the follow ing question



48. Which of the area is cultivated for w heat and maize only?

(1) 8 (2) 6 (3) 5 (4) 4

49. Which of the area is cultivated for maize only?

(1) 10 (2) 2

(3) 3 (4) 4

50. Pointing to a photograph. Bajpai said, " He is the son of the only daughter of the of my brother." How Bajpai is related to the man in the photograph?

(1) Nephew (2) Brother

(3) Father (4)Maternal Uncle

PAPER- II

1. In counter, each flip flop will toggle when its clock receives a

(1) Zero edge clock (2) Negative edge clock

(3) Positive edge clock (4) None of these

2. The process of reducing quantity of data is

(1) Data handling capacity (2) Data reduction

(3) Data processing (4) Programme

3. The dynamic properties of sample and hold circuit are important in the overall performance of

(1) ADC (2) DAC

(3) Signal conversion system (4) Sample and hold circuit

4. Consider the following interrupt

i. RST 6.5 ii. RST 7.5 iii. RST 5.5 iv. INTR

The correct descending order of these interrupts according to priority is

(1) ii, i, iii, iv (2) iv, ii, i, iii

(3) iv, iii, i, ii (4) ii, i, iii, iv

5. Consider the different typical services

i. Government

ii. Word wide telegraphy

iii. Broadcasting

iv. Satellite communication

The correct increasing order of these services according to frequency band used for those is

(1) i, iv, ii, iii (2) ii, iii, iv, i

(3) iii, ii, i, iv (4) ii, iv, i, iii

6. Match List-I (Name of the circuit) with List-II (Characteristics) and select the correct answer using the codes given below the lists :

List-I	**List-II**
A. Tunnel diode oscillator	1. Produces high current pulses of short
B. UJT oscillator	2. An LC oscillator used for generation of

sine wave at RF

C. Hartley oscillator — 3. A negative resistance oscillator for MW frequency

D. Blocking — 4. Uses negative oscillator resistance property for the Generation of sawtooth waveform

Codes :

A B C D

(1) 3 2 1 4

(2) 1 2 4 3

(3) 3 4 2 1

(4) 4 3 1 2

7. Match the list of GROUP-I with the list of GROUP-II for a JFET–

GROUP-i	GROUP-ii
(1) Pinch–off voltage decrease	(i) If channel doping reduced.
(2) Transconductance increases	(ii) If channel length increased.
(3) Transit time of carriers in channel is reduced	(iii) If channel conductivity increased.
	(iv) If channel length reduced.
	(v) If gate area reduced.

(1) A – (i), B – (iv), C–(iii)

(2) A – (i), B – (iii), C–(v)

(3) A – (i), B – (iv), C – (v),

(4) A – (ii), B – (iv), C – (v).

8. Match **List I** and **List II**:

List I	**List II**
(1) Multiplexer	(1) Sequential memory
(2) De-Multiplexer	(2) Converts decimal number to binary
(3) Shift register	(3) Data selector
(4) Encoder	(4) Routes out many data output with single input

(1) A – 3 B – 4 C – 1 D – 1 (2) A – 4 B – 3 C – 1 D – 2

(3) A – 3 B – 4 C – 2 D – 1 (4) A – 1 B – 2 C – 3 D – 4

9. Match **List** (Modulation system) and **List II** () Figure of merit

Lis I	List II
(A) AM-DSB FC	(1) 2
(B) WBFM	(2) 1
(C) PCM	(3) 3mf
(D) AM-DSB	(4) 2

(1) A – 1 B – 2 C – 3 D – 4 (2) A – 2 B – 1 C – 4 D – 3

(3) A – 2 B – 3 C – 4 D – 1 (4) A – 4 B – 3 C – 2 D – 1

10. Match **LIST–I** and **LIST – II** and select the answer using the codes given:

LIST – I (Antennas)	**LIST– II (Application)**
A. Cass grain antenna	1. Large Bandwidth
B. Yagi antenna	2. Direction Finding
C. Parabolic reflector antenna	3. Radar
D. Loop antenna	4. Directional transmission

Codes

A B C D

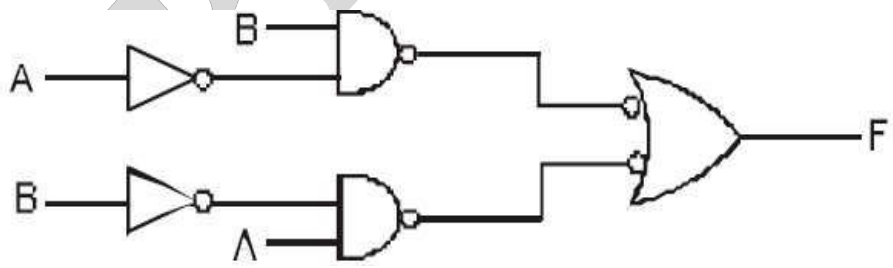
(1) 1 4 2 3

(2) 3 1 4 2

(3) 2 4 3 1

(4) 3 2 4 1

11. The logic expression for the output of the circuit shown in the figure is



(A) $f = \bar{A}\bar{B} + AB$ (B) $f = \bar{A}B + A\bar{B}$

(C) $f = \bar{A}B$ (D) $f = A\bar{B}$

12. Which of the given statement is false for serial adder?

(1) Uses shift Registers

(2) Equal to the number of bits in the binary numbers

(3) Sequential circuit

(4) Consists of a full - adder & flip - flop.

13. Convert $(111\ 0110011111010)_2$ to decimal.

(1) 66006_{10} (2) 60066_{10}

(3) 60666_{10} (4) 66606_{10}

14. Identify the function for the given minimized form.

F (A,B, C) = P M (0, 3, 5)

(1) $F=(\bar{A}\,\bar{B}\,\bar{C})+(\bar{A}\,B\,C)+(A\,\bar{B}\,C)$

(2) $F=(A\,B\,C)+(A\,\bar{B}\,\bar{C})+(\bar{A}\,B\,\bar{C})$

(3) $F=(\bar{A}+\bar{B}+\bar{C})+(\bar{A}+B+C)+(A+\bar{B}+C)$

(4) $F=(A+B+c).(A+\bar{B}+\bar{C}).(\bar{A}+B+\bar{C})$

15. What will happen after execution of the following 'C' fragment?

{ double d ;Scanf (" % C" , d) ;

(1) Compilation error

(2) Run time error

(3) Logical error

(4) No error.

16. The following loop

while (printf ("%d", printf ("az")))

printf("by:);

(1) prints azbybybyby...

(2) prints azbyazbyazbyazby...

(3) results in a syntax error

(4) None of the above

17. Consider the following program fragment if (a > b) printf (“a < b”); else printf (“a < = b”); a < = b will be printed if

(1) a > b (2) a < b

(3) a = = b (4) All of these

18. The body of the following for loop

fpr (putchar (‘a’); putchar (0); putchar (‘c’))

putchar (‘b’);

will be executed

(1) 0 times

(2) 1 time

(3) Infinitely many times

(4) Will not be executed because of syntax error

19. If storage class is missing in the array definition, by definition, by default it will be taken to be

(1) automatic

(2) external

(3) static

(4) either automatic or external depending on the place of occurrence

20. Consider the following program fragment.

procedure exchange (A: integer, B: integer)

temp : integer)

end;

begin

M : = 2; X [M] : = 4;

Exchange (M, X[M]); write (M, x[2]);

end If the parameters are passed by value, the output will be

(1) unpredictable (2) 2, 4

(3) 4, 2 (4) 2, 2

21. 4, 2 will be the output of the previous question if the parameters are passed by

(1) Reference (2) Name

(3) Value (4) None of the above

22. If the parameters are passed by name, the output will be

(1) 2, 2 (2) 4, 4 (3) 2, 4 (4) 4, 2

23. Choose the correct statement.

(1) Step-wise refinement uses top-down methodology

(2) Step=wise refinement uses bottom-up methodology

(3) Use of library routines faciliate bottom=up methodology

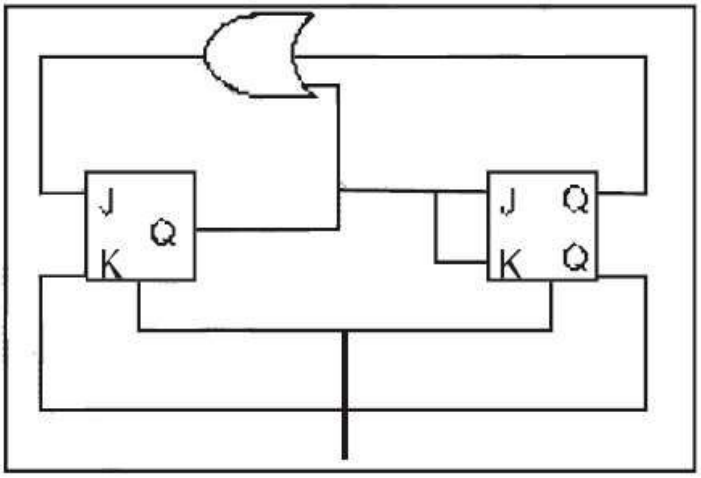
(4) A and C both

24. Which of the following logic families is well suited for high-speed operation?

(1) TTL (2) ECL

(3) MOS (4) CMOS

25. The following arrangement of JK flip-flops does the functions of a



(1) A Shift register (2) Mod-3 counter

(3) Model-2 counter (4) None of the above

26. If many functions have the same name, which of the following information, if present, will be used by the compiler to invoke the correct function to be used?

(1) The operator;;

(2) The return value of the function

(3) Function signature

(4) None of the above

27. Choose the correct remarks.

(1) C++ allows any operator to be overloaded

(2) Some of the existing operators cannot be overloaded

(3) Operator precedenece cannnot be changed.

(4) All of the above.

28. If the function chg is coded as

```
int chg (const int ex)
{
x = 10;
return (11);
}
```

then

(1) it results in compile-time error

(2) it results in run time error

(3) it prints 112

(4) it prints 1110

29. If an induction type energy meter runs fast, it can be slowed down by adjusting the

(1) lag (2) Light load

(3) position of braking magnet and making it move closer to the centre of the disc

(4) position of braking magnet and making it move away from the centre of the disc

30. Which one of the following statements is NOT correct?

(1) If everything else is equal, then a 10 bit digital ramp ADC. will have a better resolution but a longer conversion time than an 8 bit ADC

(2) The conversion time for a successive approximation increase with the increase in input voltage

(3) A flash ADC does not contain a DAC

(4) VCO is the main component of a voltage to frequency ADC

31. For a periodic function the spectral density and the auto correlation functions form

(1) Fourier transforms pair (2) Laplace transforms pair

(3) Hubert's transform pair (4) Z-transform pair

32. Match List I with List II and select the correct answer using the codes given below the lists:

List I	List II
A. Collector modulation	1. FM generation
B. Phase shift method	2. DSB generation
C. Balanced modulator	3. AM generation
D. Amplitude limiter	4. SSB generation

Codes:

A	B	C	D
(1) 3	4	1	2
(2) 4	3	1	2
(3) 3	4	2	1
(4) 4	3	2	1

33. With a real-time constraint, the transmission bandwidth needed for a digital signal with r symbols per second is equal to or greater than

(1) 1/r (2) r/2 (3) r (4) 2r

34. A dc cumulatively compounded motor delivers rated load torque at rated speed, If the series field is short-circuited, then the armature current and speed will

(1) Both decrease

(2) Both increase

(3) Increase and decrease respectively

(4) Decrease and increase respectively

35. Assertion (A) : The output voltage swing of a difference amplifying can be increased by using a current mirror circuit.

Reason (R) : The current mirror circuit has low static resistance and high dynamic resistance.

Codes:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

36. Assertion A: The part of the root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis.

Reason R: Poles and zeros which are not on the real axis always occur in conjugate pairs.

Codes:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

37. A minimum phase system has gain margin of 8 dB and a phase margin of 21°.

Assertion A : The system is stable

Reason R : For a minimum phase system, both phase margin and gain margin must be positive for the system to be stable.

Codes:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

38. Assertion A : Conductors do not permit propagation of waves more than a short distance into the conductor at microwave frequencies

Reason R: The relaxation time constant for conductors is much smaller than the

period of centimetric EM wave.

Codes:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true but R is not a correct explanation of A.

(3) A is true but R is False.

(4) A is False but R is true.

39. Which of these cannot be considered as an element of Multimedia computer

(1) CD ROM (2) Speakers

(3) Microphone (4) Network card

40. Which of the following check the syntactic correctness of a source program:

(1) Interpreter (2) Compiler

(3) Interpreter and compiler (4) None of the above

41. Thermal noise power of a resistor depends upon

(1) Its resi stance value (2) Noise temperature

(3) Bandwidth (4) Ambient temperature

42. Consider the following statements relating to a laser beam

1. It is highly monochromatic
2. Has high angular divergence
3. It is produced by spontaneous emission
4. It is used in communication wave
5. It is an electro magnetic wave

of these statements

(1) 1, 4, and 5 are correct

(2) 4 and 5 are correct

(3) 1, 2 and 3 are correct

(4) 2, 3 and 4 are correct

43. Figure of merit is always unity in

(1) SSB-SC (2) AM (3) FM (4) All of these

44. The choice of the product RC in an envelope detector using a diode and R-C circuit is governed by

(1) Both the lowest and the highest modulation frequencies
(2) Only the depth of modulation
(3) The depth of modulation and the lowest modulation frequency
(4) The depth of modulation and the highest modulation frequency

45. The operation of an inverter fed induction motor can be shifted from motoring to regenerate braking by
(1) Reversing phase sequence
(2) Reducing inverter voltage
(3) Decreasing inverter frequency
(4) Increasing inverter frequency

46. In a hollow rectangular waveguide, phase velocity is
(1) Increases with increasing in frequency
(2) Decreases with increase in frequency
(3) Independent of frequency
(4) Will vary with frequency in a given range

47. In the equivalent circuit of a transmission line, if we replace the equivalent T network by p network then
(1) Line equations will change
(2) Line equations remain unchanged
(3) Value of propagation constant will change
(4) Value of circuit impedance

48. The Q factor of a microwave resonant cavity is -
1. Proportional to volume of the cavity
2. Proportional to the total inner surface area
3. Proportional to frequency of the wave
4. Inversely proportional to metallic resistance of guide walls

The correct statements are-
(1) 1 and 2 only (2) 2 and 3 only
(3) 1, 2 and 3 (4) 1, 3 and 4

49. The built in potential in semiconductor is

(1) Dependent to doping

(2) Independent of doping

(3) Partially dependent of doping

(4) None of the above

50. An avalanche photo diode works on

(1) High Forward Bias

(2) High Forward Bias and impact ionization

(3) High Reverse Bias

(4) All of the above

51. TTL circuits with active pull up are preferred because of their stability for

(1) Wired - AND operation

(2) Wired - or operation

(3) Bus operated system

(4) Reasonable dissipation and speed of operation

52. Radiation efficiency of an antenna is defined as the ratio of

(1) Total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter

(2) The frequency at which minimum power is radiated to the frequency at which maximum power is radiated

(3) Total power accepted from the transmitter to total power generated by the transmitter

(4) Power in main lobe to that in the side lobe

53. Compared to transistor and FETs the speed of switching in a Schottky diode is

(1) Higher (2) Lower

(3) Same (4) Can't say

54. Introducing a resistor in the emitter of a common emitter amplifier stabilizes the d.c. operating point against variations in

(1) Only temperature (2) Only b of transistor

(3) Both temperature and b (4) None of these

55. In the design of digital logic families there is a trade off between

(1) Propagation delay and power dissipation
(2) Switching time and fan out
(3) Fan out and power dissipation
(4) Switching time and noise margin

56. The use of non-uniform quantization leads to
(1) Reduction in transmission bandwidth
(2) Increase in maximum SNR
(3) Increase in SNR for low level signals
(4) Simplification of quantizations process

57. A TTL totem-pole circuit is designed so that the output transistors
(1) Are always on together
(2) Provide phase splitting
(3) Provide voltage regulation
(4) Are never on together

58. To operate correctly, starting of a ring counter requires
(1) Clearing all the flip-flops
(2) Presetting one flip-flop and clearing all the others
(3) Clearing one flip-flop and presetting all the others
(4) Presetting all the flip-flops

59. The correct order of precedence from highest to lowest is:
(1) ++ ( ) * + < =
(2) ++ * - > && ==
(3) && < ++ < * !
(4) ++ * + < && =

60. DOS allows division of disk space into different portions called PARTITIONS.
(1) True
(2) False
(3) Sometime true
(4) Can't be said

61. ATTRIB is an internal DOD Command.
(1) True
(2) False
(3) It is not DOS command
(4) It is external DOS command

62. The most commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called

(1) ASCII (2). EBCDIC (3). BCD (4) All of above

63. For x = 9 , y = 5 , z = 3 the answer of if (x > y) && (y < z) statement will be.

(1) True (2) False (3) 5 (4) 2

64. Indicate which is not the characteristics of algorithm.

(1) Input (2) Effectiveness

(3) Infiniteness (4) None of the above

65. The symbol used to add description comment to the flow chart is

(1) INPUT symbol (2) START symbol

(3) PROCESSING symbol (4) ANNOTATION symbol

66. A derived data type is a combination of other already known types.

(1) True (2) False

(3) Partially true (4) None of the above

67. Which of the following is basic data type?

(1) Array (2) Character (3) Structure (4) Union

68. a << 1 is equivalent to

(1) Multiplying a by 2 (2) Dividing a by 2

(3) Adding 2 to a (4) None of the above

69. Assume an unsigned integer occupies 1 byte. Let myVar be an unsigned integer. Then myVar << 1 multiplies myVar by 2 if it is not greater than

(1) 127 (2) 255 (3) 256 (4) 128

70. In a certain machine, the sum of an integer and its 1's complement is 220 – 1. Then size of (int), in bits, will be

(1) 16 (2) 32

(3) unpredictable (4) None of the above

71. The for loop

```
for (i = 0; 1 < 10; ++i)
printf ("%d", i & 1) ;
```

prints

(1) 0101010101 (2) 0111111111

(3) 0000000000 (4) 1111111111

72. The declaration

enum cities(bethlehem, jericho, nazareth = 1, jersualem)

assigns the value 1 to

(1) Bethlehem (2) Nazareth

(3) Bethehem and nazareth (4) Iericho and nazareth

73. Content addressable memory is one in which

(1) Data is searched directly without giving address

(2) Address is given and contents are read

(3) Address is applied and contents and stored

(4) None of the above

74. Indicate which is not type of digital modulation.

(1) Phase modulation (2) Pulse code modulation

(3) Delta modulation (4) Phase shift modulation

75. The baud rate.

(1) It always equal to bit transfer rate

(2) Is equal to twice the bandwidth of an ideal channel

(3) Is not equal to signalling rate

(4) Is equal to one half the bandwidth of an ideal channel

76. The difference between a Television and monitor is

(1) Monitor can not display TV signals

(2) Monitor can not directly display a clear picture

(3) Monitor can not give a steady picture

(4) None of the above

77. A fast access small capacity semiconductor memory is

(1) PROM (2) RAM

(3) Scratchpad (4) ROM

78. To enter the zeros in a register is called

(1) Return (2) Reset

(3) Fill zero (4) None of the above

79. Isolation in ICs is required.

(1) To make is simpler to test circuits

(2) Make discontinuous current as continuous

(3) Reduce the output voltage

(4) Increase the load voltage.

80. Most of the gain and selectivity in a super heterodyne receiver is obtained in the

(1) RF amplifier (2) Mixer

(3) IF amplifier (4) Demodulator

81. Modern ac to dc converters employ GTOs instead of SCRs in order to have

(1) Low reactive volt ampere flow (2) Reliable commutation

(3) Low switching loss (4) Smaller heat sink.

82. For a single - phase two pulse phase - controlled rectifier, with a free wheeling diode across RL load,

(1) The instantaneous output voltage u_0 is always positive

(2) u_0 may be positive or zero

(3) u_0 may be positive, zero or negative

(4) u_0 is always zero or negative

83. The effect of source inductance on the performance of single - phase and three - phase full converters is to

(1) Reduce the ripples in the load current

(2) Make discontinuous current as continuous

(3) Reduce the output voltage

(4) Increase the load voltage.

84. A four quadrant operation requires

(1) Two full converters in series

(2) Two full converters connected back to back

(3) Two full converters connected in parallel

(4) Two - semi converters connected to back

85. In circulating current type of dual converter, the nature of voltage across reactor is

(1) Alternating (2) Pulsating

(3) Direct (4) Triangular.

86. The output of a single - phase full - wave rectifier contains

(1) Dc plus even harmonics

(2) Dc plus odd and even harmonics

(3) Dc plus both odd and even harmonics

(4) Dc and no harmonics

87. A time - margin for series inverter ensures

(1) Low power loss (2) Safety of the device

(3) Improved power factor (4) Absence of harmonics

88. The output voltage wave form of a 3 - phase square - wave inverter contains

(1) Only even harmonics (2) Both odd and even harmonics

(3) Only odd harmonics (4) Only triplan harmonics

89. Integral cycle control

(1) Is very fast in action

(2) Does not introduce sub - harmonics in the supply lines which are different to filter

(3) Cannot be used on inductive loads

(4) Can be advised only for loads with high item constants and limited range control.

90. A cycloconverter is a frequency converter from

1. higher to lower frequency with one - stage conversion

2.higher to lower frequency with two - stage conversion

3. lower to higher frequency with one - stage conversion

4. ac at one frequency to dc and then dc to ac at a different frequency

From these, the correct statements are

(1) 2, 4 (2) 1 only (3) 2, 3 (4) 1,3

91. The cycloconverters (CCs) require natural or forced commutation as under:

(1) Natural commutation in both step - up and step - down CCs

(2) Forced commutation in both step - up and step - down CCs

(3) Forced commutation in the step - up CCs

(4) Forced commutation in step - down CCs

92. Consider the following statements regarding cycloconverters

1. In 1 - phase to 1 - phase CC, firing angle may be varied
2. In 3 - phase to 1 - phase CC, firing angle may be kept constant
3. In 3 - phase to 1 - phase CC, firing angle may be kept constant
4. In 3 - phase to 1 - phase CC, firing angle must be varied

From these, the correct statements are

(1) 2,4 , (2) 1, 3,

(3) 2,3 (4) 2,3,4

93. Bulk power transmission over HVDC lines are preferred on account of

(1) Low cost of HVDC terminals

(2) No harmonic problems

(3) Minimum line power

(4) Simple protection

94. The most accurate and versatile method of achieving reactive power compensation is by using.

(1) Switched capacitors

(2) Fixed capacitor with controlled reactor

(3) Saturable reactor with capacitor bank

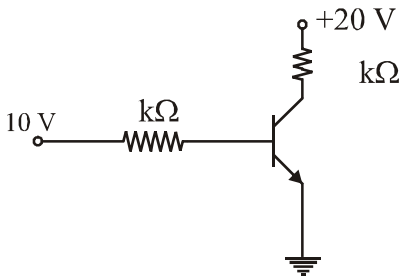
(4) Saturable reactor with controlled reactor

95. A memory system has a total of 8 memory chips, each with 12 address lines and 4 data lines. The total size of the memory system is

(1) 6 kbytes (2) 32 kbytes

(3) 48 kbytes (4) 64 kbytes

96. In the transistor circuit shown in the figure, collector-to-ground voltage is +20 V. Which of the following is the probable error ?



97. The network has 10 nodes and 17 branches. The number of different node pair voltages would be

(1) 7 (B)9 (3) 10 (4) 45

98. Two incandescent light bulbs of 40 W and 60W rating are connected in series across the mains. Then

(1) The bulbs together consume 100 W

(2) The bulbs together consume 50 W

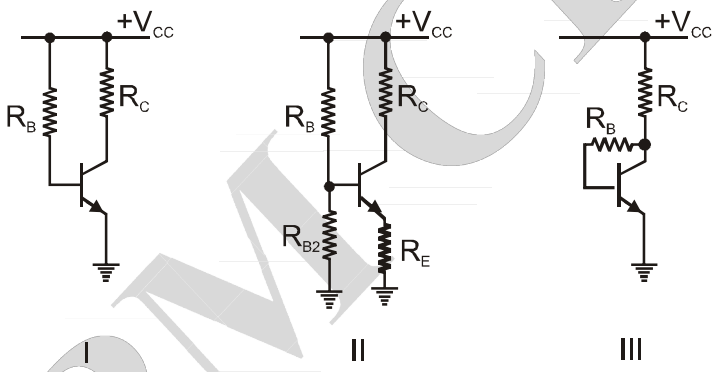
(3) The 60 W bulb glows brighter

(4) The 40 bulb glows brighter

99. If 7 bits are used to store a character, the percentage reduction of need storage will be

(1) 22.5 (2) 2.5 (3) 8 (4) 12.5

100. Three different circuits for biasing junction transistor amplifiers are given below.



The currect decreasing order of preference of these circuits from the point of view of bias stabilisation is

(1) I, II, III (2) III, II, I (3) II, III, I (4) I, III, II

ANSWER KEY

PAPER-I

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Answer	4	1	4	2	4	3	1	2	1	2	1	4	3	4	1	1	4	2	3	3
Question	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Answer	4	1	2	4	1	4	1	3	4	2	4	3	1	1	1	2	3	4	3	4
Question	41	42	43	44	45	46	47	48	49	50										
Answer	2	2	1	4	1	4	4	4	3	4										

PAPER-II

QUESTIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ANSWER	2	2	1	3	2	3	3	2	3	3	2	2	3	4	2	4	4	1	4	2
QUESTIONS	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
ANSWER	1	2	4	2	2	2	4	3	1	2	1	3	4	2	3	1	1	2	4	2
QUESTIONS	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
ANSWER	2	1	1	3	3	2	2	4	1	3	4	1	2	3	3	3	3	2	4	1
QUESTIONS	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
ANSWER	4	1	1	3	4	1	2	4	1	4	1	4	1	2	1	1	1	2	4	3
QUESTIONS	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
ANSWER	2	2	3	3	1	1	2	3	4	4	3	2	3	2	2	2	2	4	4	3

HINTS AND SOLUTIONS

PAPER-I

1.(4) Eklavya schools will be established for scheduled caste (SC) and schedule tribe students by 2022 on the lines of Navodaya schools.

They will be model residential schools set up in each Block. It will in areas with more than 50% tribal areas and 20,000 tribal people.

These schools will be part of Navodaya Vidyalayas. It will provide training in sports and skill development.

It has special facilities for preserving local art and culture.

2.(1) Revitalising Infrastructure and Systems in Education (RISE) Scheme :

RISE scheme aims to lend low-cost funds to government higher educational institutions. It will be launched with a total investment of Rs. 1 lakh crore in the next

four years. It will be financed via restructured higher education financing agency (HEFA), a non-banking financial company.

3.(4) The World Sustainable Development Summit – 2018 was held in New Delhi on February 16.

The summit will address a wide variety of issues, including combating land degradation and air pollution, effective waste management and create financial mechanisms to enable effective climate change mitigation.

The theme of the 2018 Summit is – Partnerships for a Resilient Planet, which seeks to create action frameworks to resolve some of the most urgent challenges facing developing economies in the backdrop of climate change.

It seeks to bring together on a common platform, global leaders and thinkers in the fields of sustainable development, energy and environment sectors.

4.(2) The 9-member committee, headed by former ISRO chief K Kasturirangan, was constituted by the Union HRD Ministry to draft new National Education Policy (NEP) on June 2017.

The committee will submit its report by March 31, 2018. The existing NEP was framed in 1986 and revised in 1992.

5.(4) An historic agreement to combat climate change and unleash actions and investment towards a low carbon, resilient and sustainable future was agreed by 195 nations in Paris in Dec 2015.

The Paris Agreement for the first time brings all nations into a common cause based on their historic, current and future responsibilities.

The universal agreement's main aim is to keep a global temperature rise this century well below 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels.

The 1.5 degree Celsius limit is a significantly safer defense line against the worst impacts of a changing climate.

6.(3) Under Part XXI of the Constitution of India, which deals with "Temporary, Transitional and Special provisions", the State of Jammu and Kashmir has been accorded special status under Article 370.

Even though included in 1st Schedule as 15th state, all the provisions of the

Constitution which are applicable to other states are not applicable to J&K.

Special Features- J&K is the only state in India which has a Constitution of its own. The Constitution of J&K was enacted by a separate Constituent Assembly set up by the State and it came into force on 26th January 1957.

7.(1) Global warming is the increase in Earth's near-surface air and ocean temperatures. The greenhouse effect is when water and carbon dioxide absorb outgoing infrared radiation, increasing the planet's temperature.

Greenhouse gases contribute to global warming.

What is determined to be a greenhouse gas is any heat-trapping gas present in the Earth's atmosphere.

The two most common greenhouse gases are water vapor and carbon. These gases help absorb infrared radiation and regulate the Earth's climate.

However, the increase in industrial production has increased the amount of greenhouse gases present in the atmosphere.

The increase in carbon dioxide emissions has made it difficult for heat to escape the atmosphere which in turn contributes to the warming effect.

8.(2) **The Vienna Convention** for the Protection of the Ozone Layer is a Multilateral Environmental Agreement. It was agreed upon at the Vienna Conference of 1985 and entered into force in 1988.

It acts as a framework for the international efforts to protect the ozone layer.

The Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.

The Minamata Convention on Mercury is an international treaty designed to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.

The Convention was signed by delegates representing close to 140 countries on 19 January 2013 in Geneva and adopted later that year on 10 October 2013 on a Diplomatic Conference held in Kumamoto, Japan. The Convention is named after the Japanese city Minamata.

9.(1) In July 2013, Supreme Court had ruled that a person, who is in jail or in police custody, cannot contest elections to legislative bodies.

Representation of the People (Amendment and Validation) Bill, 2013 however,brought two key changes:

Firstly , even if a person is prohibited from voting due to being in police custody or in jail, as long as his name is entered on the electoral roll he shall not cease to be an elector.

This implies that he can file nomination for an election. Secondly, definition of "disqualified" in the Act has been amended.

Prior to this act, the definition of disqualified means disqualified for either being chosen as or being a MP or MLA.

Secondly, definition of "disqualified" in the Act has been amended.

The amendment adds a ground to the definition that the disqualification has to be due to conviction for certain specified offences and can be on no other ground.

Conviction for only these certain offences would result in the person's name being removed from the electoral roll and he would cease to be an elector.

10.(2)

11.(1) Water Borne diseases are largely caused by micro-organisms present in human or animal waste, which find their way into human body.

These diseases are infectious, which means that they can spread from one person to another.

So high standards of hygiene and sanitation are needed to stop the disease from spreading.

Waterborne diseases include:

(i) Typhoid fever
(ii) Giardia
(iii) Dysentery
(iv) Cholera
(v) Diarrhoea (caused by a variety of pathogens)
(vi) Hepatitis
(vii) Polio

(viii) Worms

12.(4) Research has been defined in a number of different ways.

A broad definition of research is given by Godwin Colibao: "In the broadest sense of the word, the definition of research includes any gathering of data, information, and facts for the advancement of knowledge."

Another definition of research is given by John W. Creswell, who states that "research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue".

It consists of three steps: pose a question, collect data to answer the question, and present an answer to the question.

The Merriam-Webster Online Dictionary defines research in more detail as "a studious inquiry or examination; especially investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws.

13.(3) In **descriptive survey method**- we've to use questionnaires (Because it's 'survey).

Descriptive research is all about describing people who take part in the study.

There are three ways a researcher can go about doing a descriptive research project, and they are: Observational, Case study and Survey, defined as a brief interview or discussion with an individual about a specific topic

Historical method- we have to use primary and secondary sources.

Historical method comprises the techniques and guidelines by which historians use primary sources and other evidence, including the evidence of archaeology, to research and then to write histories in the form of accounts of the past.

In **experimental method**- we can collect data in a way that permit standardized tests.

The experimental method is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables.

An ex post facto research design is a method in which groups with qualities that already exist are compared on some dependent variable.

Also known as “after the fact” research, an ex post facto design is considered quasi-experimental because the subjects are not randomly assigned - **they are grouped based on a particular characteristic or trait.**

14.(4) According to Burton, **Teaching is the stimulation, guidance, direction and encouragement of learning**.

Good teaching requires some basics that a teacher should follow to achieve the main goal of teaching.

Good teaching is as much about passion as it is about reason. It’s about not only motivating students to learn, but teaching them how to learn, and doing so in a manner that is relevant, meaningful, and memorable.

It’s about caring for your craft, having a passion for it, and conveying that passion to everyone, most importantly to your students.

Good teaching is also about bridging the gap between theory and practice. It is about listening, questioning, being responsive, and remembering that each student and class is different. It is about caring, nurturing, and developing minds and talents.

Diagnosis, Remedy, Direction and Feedback are required for good teaching.

15.(1) The National Institution for Transforming India, also called NITI Aayog, was formed via a resolution of the Union Cabinet on January 1, 2015.

NITI Aayog is the premier policy ‘Think Tank’ of the Government of India, providing both directional and policy inputs.

While designing strategic and long term policies and programmes for the Government of India, NITI Aayog also provides relevant technical advice to the Centre and States.

The Government of India, in keeping with its reform agenda, constituted the NITI Aayog to replace the Planning Commission instituted in 1950.

An important evolutionary change from the past, NITI Aayog acts as the quintessential platform of the Government of India to bring States to act together in national interest, and thereby fosters Cooperative Federalism.

The Prime minister is its Chairperson.

16.(1) Horizontal communication is the communication where information or messages flows among the similar or same level statuses of people in the organizational structure.Horizontal communication is the communication that flows laterally within the organization, involves persons at the same level of the organization. Horizontal communication normally involves coordinating information and allows people with the same or similar rank in an organization to cooperate or collaborate. Thus in terms of statuses horizontal method is used.

17.(4) Spam is an irrelevant or unsolicited messages sent over the Internet, typically to large numbers of users, for the purposes of advertising, phishing, spreading malware, etc.

Spam is flooding the Internet with many copies of the same message, in an attempt to force the message on people who would not otherwise choose to receive it. Most spam is commercial advertising, often for dubious products, get-rich-quick schemes, or quasi-legal services.

18.(2) Propositions are contradictory when the truth of one implies the falsity of the other, and conversely.

if 'All thieves are poor' is false, then the proposition 'Some thieves are not poor' must be true**.**

19.(3) non verbal communication is communication of feelings, emotions, attitudes, and thoughts through body movements / gestures / eye contact, etc.

20.(3) % increase = $\frac{0.25 crore}{1\, crore} \times 100$

= 25%

21.(4) for company A

1 + 1.25 + 1.5 +1.75 + 1.75 + 1.75 +2

= 11 crore

22.(1) (2.5 – 1) crores = 1.5 × 100 00 000

= 150 00 000

23.(2) Total production of B

= 2.5 + 2.5 + 3 + 2.75 +2.25 + 2.25 +2.5

= 17.75

Average production = $\frac{17.75}{7} = 2.55$

24.(4) In year 2004.

25.(1) Qualitative data collection techniques were used as the primary research methods for this study. Participant and direct observation plus note taking were the most important techniques used.

26.(4) Production was at very low level.

27.(1) Ethnic diversity of the people was not appropriately realized by the Central Government.

28.(3) Central economic planning found to be difficult because autonomy w as given to the States in certain matters

29.(4) Because that time no common language emerged.

30.(2) "The Indianisation of the Indian Civil Service" , can be cited as an exercise in democratic practice in India before Independence

31.(4) The information to be collected in survey method are related to present position, aims of the research &the attainment of aim of research

Exposure units must be defined Must be considered in developing DQOs for project, or results may not be accepted.

Sufficient samples are required 8-10 samples w hen contaminant concentrations vary w ithin a narrow range 10-15 sample w hen concentrations are less predictable Calculate 90th Upper Confidence Limit (UCL)

32.(3) One of the essential characteristics of research is usability.

33.(1) A parliamentary system is a system of democratic government in which the ministers of the Executive Branch derive their legitimacy from and are accountable to a Legislature or parliament; the Executive and Legislative branches are interconnected. It is a political system in which the supreme power lies in a body of citizens w ho can elect people to represent them.

34.(1) IVRI is situated in Izat Nagar.

IAT is situated in Pune

IISc is situated in Banglore

NIEPA is situated in Delhi.

35.(1) The prime minister of India is appointed from the leading Party in Lok Sabha.

36.(2) The study of interrelations between Organism and their environment is called ecology.

37.(3) The term ICT is now also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system.

38.(4) Fossil fuels are fuels made by natural processes such as anaerobic decomposition of buried dead organisms.

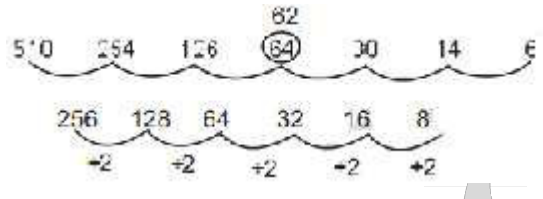
Ex. Oil, Natural gas, coal etc.

39.(3) Noise in excess of 80-100DB is called noise pollution.

40.(4) Effectiveness of teaching depends on Subject Understanding of the Teacher

41. (2) The participation of students w ill be maximum if Discussion Method is used for teaching.

42.(2)



"30, 64 is wrong & must be replaced by 62.

43.(1) Deductive reasoning determines whether the truth of a conclusion can be determined for that rule, based solely on the truth of the premises.

44.(4) $(2)^2 = 4$, $(5)^2 = 25 \Rightarrow 425$

$(2)^2 = 4$, $(4)^2 = 16 \Rightarrow 416$

$(3)^2 = 9$, $(5)^2 = 25 \Rightarrow 925$.

45.(1) Such decisions as given in the statement are taken only after taking the existing vacancies into consideration. So, I implicit while II does not implicit.

46.(4) CD-ROM disk is the latest write-once optical storage media

47.(4) Domain Name identifies a specific web page and its computer on the Web.

48.(4) The required region is the one which is common only to the rectangle and circle and is not a part of either the triangle or square

49.(3) The required region is the one which lies inside the circle but outside the rectangle, square and triangle,

50.(4) The man in the photo is the son of the sister of Bajpai. Hence, Bajpai is the maternal uncle of the man in the photograph.

PAPER II

1.(2) In counter, each filp flop will toggle when its clock receives a negative edge clock.

2.(2) The process of reducing quantity of data is Data reduction.

3.(1) The dynamic properties of sample and hold circuit are important in the overall performance of ADC.

4.(3) Interrupts Priority

TRAP 1st (highest)

RST T.S 2nd

RST 6.5 3rd

RST 5.5 4th

INTR 5th (Lowest).

5.(2) Band Typical services

VLF (3 – 30 KHz) word wide telegraphy

MF (300 – 3000 KNz) Broadcasting

SHF (3000 – 30, 000 MHz) Satellite communication

EHF (30, 000 – 300, 000 MHz) Government

6.(3) (1) Tunnel diode oscillator → A negative resistance oscillator for mw frequency

(2) UJT oscillator → Uses negative oscillator → resistance property for the gen eration of sowtooth waveform.

(3) Hartley oscillator → An LC oscillator used for generation of sinewave at RF.

(4) Blocking → Produces high current pulses of short.

7.(3) In a JFET.

(1) Pinch - off voltage decreases if channel doping reduced.

(2) Transconductance increases if channel length reduced.

(3) Transit time of carriers in channel is reduced if gate area reduced.

8.(2) (1) Multiplexer → Routes out many data output with single input

(2) De-Multiplexer → Data selector

(3) Shift register → Sequential memory

(4) Encoder → Converts decimal number to binary.

9.(3) AM – DSBFC $\rightarrow$ 1

WBFM $\rightarrow$ 3mf

PCM $\rightarrow$ 22N

AM – DSB $\rightarrow$ 2.

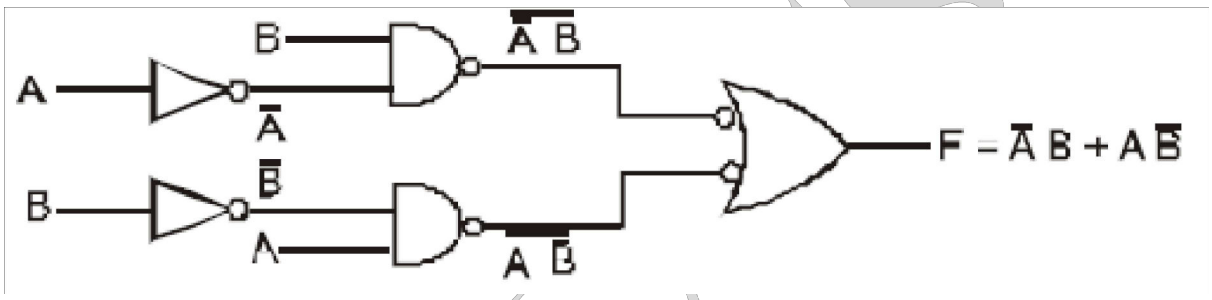
10.(3) Cass grain antenna $\rightarrow$ Radar.

Yagi antenna $\rightarrow$ Large Bandwidth

Parabolic reflector antenna $\rightarrow$ Directional transmission

Loop antenna $\rightarrow$ Direction Finding

11.(2)



12.(2) Serial adder requires only one full adder circuit and a carry flip - flop to store the output carry. While parallel adder is equal to the number of bits in the binary numbers.

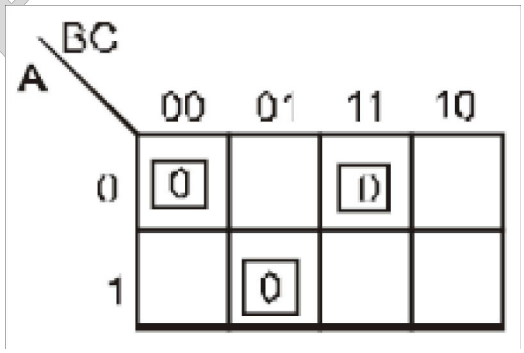
13.(3) $1110, 1100, 1111, 1010_{2} = (ECFA)_{16}$

$(ECFA)_{16} = (14 * 16^3) + (12 * 10^2) + (15 * 16^1) + (10 * 16^0)$

$= 57344 + 3072 + 240 + 10$

$= 60666_{10}$

14.(4)



F (A, B, C) = (A + B + c) (A+B+C) . (A + B+C) PDS form of function.

15.(2) The code / fragment given is syntactically correct but will give a Run - time error as the data type is not matched with respect to the given format specifier. i.e. the given format specifier is for character data type not double.

16.(4) printf (*az") prints az and returns a value 2 (since it printed two characters). So, the condition results in the printing of az2. Since it always returns 2, it is an infinite loop. The output will be az2byaz2by. . .

17.(4) The else clause has no brackets i.e., {and}. This means the else clause is made up of only one statement. So, printf ("a < b"); will be executed anyway, i.e. if a > b or a < = b. Hence the answer is (4)

18.(1) The condition is putchar (0). This returns a value - which is a false condition. So , the loop will not be executed even once.

19.(4) If it is coming with in a function, the storage class will be taken to be automatic, otherwise external.

20.(2) In the parameters which are passed by value, the function will be manipulating a local copy of the argument value. Any change will be local to the function and hence will not be reflect in the calling environment. Thus the output will be 2,4

21.(1) In call by reference, the address of the actual arguments will be passed to the function. Any change done environment.

22.(2) In this case, the following statements will be executed by the function temp; M; M : = X[M]; X [X]: =temp; So. what is evaluated is temp : = 2; M : = X[2]; X[M]: = temp ; i.e., M will be assigned 4, after which X [M], i.e., X[4] will be assigned 2. X[2] remains unaltered. So 4, 4 will be printed.

23.(4) The correct statement are

1 Step-wise refinement uses top-down methodology

2 The use of library routines faciliate bottom=up methodology

24.(2) ECL is well suited for high-speed operation.

25.(2) The given arrangement of JK flip-flops does the functions of a Mod-3 counter.

26. (2) The return value of the function will be used by the compiler to invoke the correct function.

27.(4) All statements are correct.

28.(3) Function chg prints 112.

29.(1) If an induction type energy meter runs fast, it can be slowed down by adjusting the lag.

30.(2) The conversion time for a successive approximation increase with the increase in input voltage statement is not the correct.

31.(1) For a periodic function the spectral density and the autocorrelation functions form Fourier transforms pair.

32.(3) A. Collector modulation - AM generation

B. Phase shift method - SSB generation

C. Balanced modulator - DSB generation

D. Amplitude limiter - FM generation

33.(4) With a real-time constraint, the transmission bandwidth needed for a digital signal with r symbols per second is equal to or greater than 2r.

34.(2) A dc cumulatively compounded motor delivers rated load torque at rated speed, If the series field is short-circuited, then the armature current and speed will increases.

35.(3) The output voltage swing of a difference amplifier can be increased by using a correct mirror circuit is TRUE but the given Reason (R) is False.

36.(1) The part of the root locus on the real axis is not dependent upon the poles and zeros which are not on the real axis because poles and zeros which are not on the real axis always occur in conjugate pairs.

37.(1) For a minimum phase system, both phase margin and gain margin must be positive for the system to be stable. So the system is stable.

38.(2) Depth of penetration $= \delta = \sqrt{\frac{2}{\omega\mu\sigma}}$, where $\sigma = \frac{ne^2\tau}{m}$ $t =$ relaxation time

d would be small, if s is large, which itself depends upon relaxation time.

t for conductors is of the order of $10.^{14}$ s, for $l = 3 \times 10^{-2}$ cm

Period of centimetric EM waves $= \frac{\lambda}{V_0} = \frac{3\times10^{-2}}{3\times10^{8}} = 10^{-10}$ sec

Therefore, even though t is much smaller than period of centimetric waves but it is not the correct reason for the assertion given.

39.(4) Network card cannot be considered as an element of Multimedia computer

40.(2) Compiler check the syntactic correctness of a source program.

41.(2) Thermal noise power of a resistor depends upon noise temperature.

42.(1) A laser beam is

i. highly monochromatic

ii. used in communication wave

iii. An electro magnetic wave.

43.(1) Figure of merit is always unity in SSB-SC.

44.(3) The choice of the product RC in an envelope detector using a diode and an R-C circuit is governed by the depth of modulation and the lowest modulation frequency.

45.(3) The operation of an inverter fed induction motor can be shifted from motoring to regenerate braking by decreasing inverter frequency.

46.(2) In a hollow rectangular waveguide, phase velocity decreases with increase in frequency.

47.(2) In the equivalent circuit of a transmission line, if we replace the equivalent T network by p network them line equations remain unchanged.

48.(4) The Q-factor of a microwave resonant cavity is

i. Proportional to volume of the cavity

ii. Proportional to frequency of the wave

iii. Inversely proportional to metallic resistance of guide walls.

49.(1) The built in potential in semiconductor is Dependent to doping.

50.(3) An avalanche photo diode works on High Reverse Bias.

51.(4) TTL circuits with active pull up are preferred because of their stability for reasonable dissipation and speed of operation.

52.(1) Radiation efficiency of an antenna is defined as the ratio of total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter.

53.(2) Compared to transistor and FETS the speed of switching in a schottky diode is lower.

54.(3) Introducing a resistor in the emitter of a common emitter amplifier stabilizes the d.c. operating point against variations in both temperature and b.

55.(3) In the design of digital logic families there is a trade off between fan out and power dissipation.

56.(3) The use of non-uniform quantization leads to increase in SNR for low level signals.

57.(3) A TTL totem - pole circuit is designed so that the output transistors provide voltage regulation.

58.(2) On a Ring counter , initially the first flip - flop is preset to 1. so the initial state is 1000.

59.(4) Correct order of precedence from higher to lowest is :-

++

*

+)

<

&&

=

60.(1) Yes it is true that DOS allows division of disk space into different portions called partitions

61.(4) ATTRIB is an external DOS Command.

62.(1) The most commonly used standard data code to represent alphabetical, numerical and punctuation characters used in electronic data processing system is called ASCII

63.(1) For x = 9 , y = 5 , z = 3 , the given statement if (x > y) && (y > z) will be true

64.(3) Infiniteness is not the characteristics of algorithm.

65.(4) The symbol used to add description comment to the flow chart is ANNOTATION symbol.

66.(1) Yes it is true that a derived data type is a combination of other already known types.

67.(2) Character is a basic data type.

68.(4) The left shift operator <<, pushes out the most significant (left-most) bit. If it happens to be a 1, a << 1, will not be same as multiplying a by 2.

69.(1) If the most significant bit is to be zero, the maximum number that can be stored in 7 bits is 127.

70.(4) The sum (or bit-wise OR) of a number and its 1's complement will be all 1's. How many 1's depends on how many bits are needed to represent the number. If the sum is 220 – 1, then the size of (int) in bits must be 20.

71.(1) The binary representation of odd numbers will have a 1 as the least significant digit. So, an odd number ANDed with 1, produces a 1, Even number end with 0. So, an even number ANDed with 1,produces a 0. This for loop generates even and odd numbers alternatively. So, it prints alternate 0's and 1's.

72.(4) The listed places will be assigned the values 0, 1, 1, 2 respectively.

73.(1) Content addressable memory is one in which data is searched directly without giving address

74.(2) Pulse code modulation is not the type of digital modulation.

75.(1) The baud rate is always equal to bit transfer rate.

76.(1) Monitor can not display TV signals

77.(1) PROM

78.(2) Reset

79.(4) To minimize electrical interaction between circuit components, isolation in ICs is required.

80.(3) Most of the gain and selectivity in a super heterodyne receiver is obtained in the IF amplifier.

81.(2) Modern ac to dc converters employ GT Os instead of SCRs in order to have reliable commutation.

82.(2) For a single - phase two pulse phase - controlled rectifier, with a freewheeling diode across RL load,u_0 may be positive or zero.

83.(3) The effect of source inductance on the performance of single - phase and three - phase full converters is to reduce the output voltage.

84.(3) A four quadrant operation requires two full converters connected in parallel.

85.(1) In circulating current type of dual converter, the nature of voltage across reactor is alternating.

86.(1) The output of a single - phase full - wave rectifier contains Dc plus even harmonics

87.(2) A time - margin for series inverter ensures safety of the device.

88.(3) The output voltage wave form of a 3 - phase square - wave inverter contains only odd harmonics.

89.(4) integral cycles control can be advised only for loads with high item constants and limited range control.

90.(4) A cycloconverter is a frequency converter from-

(i). higher to lower frequency with one - stage conversion

(ii). lower to higher frequency with one - stage conversion

91.(3) The cycloconverters (CCs) require natural or forced commutation as under forced commutation in the step - up CCs.

92.(2) Regarding cycloconverters -

(i). In 1 - phase to 1 - phase CC, firing angle may be varied

(ii). In 3 - phase to 1 - phase CC, firing angle may be kept constant

93.(3) Bulk power transmissions over HVDC lines are preferred on account of minimum line power.

94.(2) The most accurate and versatile method of achieving reactive power compenstion is by using fixed capacitor with controlled reactor.

95.(2) Each clip has 2^{12} = 4096k bytes = 4 k bytes then the memory has 8 × 4 bytes.

96.(2) For collector ground which is the same as emitter terminal to read full supply voltage at 20 V, no current should be drawn and this can happen if emitter to ground connection is open as then there will be neither I_H or I_C.

97.(2) The network has 10 nodes and 17 branches. The number of different node pair voltages would be 9.

98.(4) Two incandescent light bulbs of 40 W and 60W rating are connected in series across the mains. Then the 40 bulb glows brighter

99.(4) For each 8 bits one can save 1 bit. So percentage reduction will be 1/8*100 i.e., 12.5%.

100.(3) The currect decreasing order is II, III, I.

II circuit is the most stable , III circuit is less stable and I circuit is least stable.